

## PATENT COOPERATION TREATY

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## INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY

(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference 47422	<b>FOR FURTHER ACTION</b>		See Form PCT/IPEA/416
International application No. PCT/T2004/000548	International filing date (day/month/year) 05.10.2004	Priority date (day/month/year) 08.10.2003	
International Patent Classification (IPC) or national classification and IPC G01S15/89, G01S7/52			
Applicant ACTIS ACTIVE SENSORS S.R.L. et al.			
<p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 6 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> <i>(sent to the applicant and to the International Bureau)</i> a total of sheets, as follows:</p> <ul style="list-style-type: none"> <li><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</li> <li><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</li> </ul> <p>b. <input type="checkbox"/> <i>(sent to the International Bureau only)</i> a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in computer readable form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p>			
<p>4. This report contains indications relating to the following items:</p> <ul style="list-style-type: none"> <li><input checked="" type="checkbox"/> Box No. I Basis of the opinion</li> <li><input type="checkbox"/> Box No. II Priority</li> <li><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</li> <li><input type="checkbox"/> Box No. IV Lack of unity of invention</li> <li><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</li> <li><input type="checkbox"/> Box No. VI Certain documents cited</li> <li><input type="checkbox"/> Box No. VII Certain defects in the international application</li> <li><input type="checkbox"/> Box No. VIII Certain observations on the international application</li> </ul>			
Date of submission of the demand 30.05.2005	Date of completion of this report 14.03.2006		
Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Authorized Officer Zaneboni, T Telephone No. +49 89 2399-7140		



**INTERNATIONAL PRELIMINARY REPORT  
ON PATENTABILITY**

International application No.  
PCT/IT2004/000548

**Box No. I Basis of the report**

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
  - This report is based on translations from the original language into the following language, which is the language of a translation furnished for the purposes of:
    - international search (under Rules 12.3 and 23.1(b))
    - publication of the international application (under Rule 12.4)
    - international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements\*** of the international application, this report is based on (*replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report*):

**Description, Pages**

1-30 as originally filed

**Claims, Numbers**

1-26 as originally filed

**Drawings, Sheets**

1-29 as originally filed

a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3.  The amendments have resulted in the cancellation of:
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):
4.  This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).
  - the description, pages
  - the claims, Nos.
  - the drawings, sheets/figs
  - the sequence listing (*specify*):
  - any table(s) related to sequence listing (*specify*):

\* If item 4 applies, some or all of these sheets may be marked "superseded."

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**Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement**

**1. Statement**

Novelty (N)	Yes: Claims	1-26
	No: Claims	
Inventive step (IS)	Yes: Claims	9
	No: Claims	1-8,10-26
Industrial applicability (IA)	Yes: Claims	1-26
	No: Claims	

**2. Citations and explanations (Rule 70.7):**

**see separate sheet**

**V. Novelty and inventive step (Article 33 PCT)**

1. The documents of the International Search Report are numbered *seriatim* (D1-D6). It is noted that according to the Applicant D1 as a print-out from the papers of the IEEE International Ultrasonics Symposium held in Honolulu, Hawaii, October 5 to 8 2003 was handed out well after the end of the symposium. Furthermore, the corresponding representation was given on the 8th of October. Since the priority has been found valid, D1 does not qualify as prior art within the meaning of Rule 33.1 PCT.
2. **Claims 14 and 15** are considered to lack clarity (Art. 6 PCT), since the antecedent of "weighted local estimators" is missing when **claims 14 or 15** depend on claims 1-7.
3. The subject matter of **claims 1-8 and 10-26** is considered to lack inventive step, Art. 33 (3) PCT.
  - 3.1 D2 discloses the following features of **claim 1**:
    - (a) A method of spectral analysis of a radio frequency ultrasonic signal returned from a structure subjected to an ultrasound examination (D2: abstract, lines 1-2), comprising the phases of:
    - (b) transmitting an ultrasonic excitation signal to a portion of said structure subjected to examination and receiving a radio frequency response signal from said structure (D2: see Figure 2 Upper left);
    - (c) applying a sequence of filtering operations to obtain decomposition of the band of the radio frequency response signal into a plurality of frequency bands (D2: page 270, last 4 lines; the fact whether there is a plurality of frequency bands or not depends on the frequency band of the radio frequency signal, not on the type of transform used; in particular the additional features of claim 11 show that any time-frequency transform can be used);

- (d) from the coefficients resulting from said filtering operation, calculating local estimators containing information on the spectrum of the radio frequency signal (D2: page 273, lines 10-11);
- (e) wherein said local estimators are combined with parameters representative of the shape of a statistical distribution of said local estimators (D2: page 273, last paragraph).

Hence, the disclosure of D2 differs from the subject matter as defined by claim 1 by the additional feature of

- (f) combining the local estimators with the parameters representative of a shape into a portion of an ultrasound image.

However, displaying the result of the method in an image is considered a usual measure of design.

- 3.2 Moreover, D2 discloses the additional features of **claim 2** (see Figure 2), **claim 11** (D2: page 272, lines 1-4) and **claim 20** (D2: page 272, lines 1-4). Consequently, these features cannot lend inventive step to the subject matter of any claim.
- 3.3 **Independent claim 17** differs from the subject matter as defined by claim 1 in combination with the additional features of claims 4 and 7 merely by **leaving out** the step of combining the local estimators with parameters representative of the shape of a statistical distribution. Since the combination of claims 1, 4 and 7 is considered to lack inventive step, the subject matter of claim 17 lacks inventive step.
- 3.4 **Independent claim 26** defines an ultrasound imaging system comprising means to carry out the a method according to claims 1-25. Since such a system is implicit to the disclosure of D2 (see e.g. Figure 1), the subject matter of claim 26 lacks inventive step.
- 3.5 The additional features of dependent **claims 4, 5, 8, 12-15, 18 and 21-24** are known from D3. Since both D2 and D3 relate to the spectral analysis of radiofrequency

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(SEPARATE SHEET)**

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ultrasound signals, the combination of the disclosure of these documents leads to the claimed subject matter without an inventive step, Article 33(3) PCT.

- **claim 4:** D3: paragraphs [93] to [97] and Figures 7A to 7G of D3;
- **claim 5:** D3: paragraph [97], lines 1-3;
- **claim 8:** D3: Figure 7G;
- **claims 12, 13, 21 and 22:** D3: paragraph [37], lines 7-10 and paragraph [38];
- **claims 14, 23:** D3: paragraph [99];
- **claim 15, 24:** D3: paragraph [33], lines 13-19;
- **claim 18:** D2: see figure 2;

- 3.6 The additional features of **claims 3, 6, 7, 10, 16, 19 and 25** concern measures of usual design, Article 33(3) PCT.
4. The additional features of **claim 9** do not appear to be disclosed or rendered obvious by the prior art on file. Consequently, they appear comply with the provisions of Article 33(1) to (3) PCT and to be novel and to involve an inventive step.
5. The subject matter of all claims is industrially applicable (Article 33(4) PCT).